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## **REMARKS**

As a preliminary matter, Applicants respectfully traverse the outstanding Office Action (Paper No. 7) in its entirety as being nonresponsive. Section 707.07(f) of the MPEP places a burden upon the Examiner, when repeating a previous rejection, to first note and answer all arguments and amendments presented by Applicants traversing the rejection. In the present case, the Examiner has not done so.

Specifically, the Examiner's entire "Response to Arguments" consist of one line only, which asserts that Applicants' arguments are all moot "in view of the new grounds of rejection presented above." Applicants point out, however, that no new grounds of rejection have been actually presented by the Examiner. In fact, each and every single ground of rejection presented in the outstanding Office Action are identical to those cited against the present invention in the previous Office Action (Paper No. 5). No new prior art has been cited against the present invention, no new United States Code sections have been cited against the present invention, and the Examiner has not demonstrated where any of the amended features of the present invention can be found in any of the cited prior art references of record.

It is entirely inappropriate for the Examiner to simply ignore all of Applicants' arguments and amendments by asserting "new grounds of rejection," when no such new grounds have even been stated. Accordingly, the outstanding Office Action should be vacated in its entirety, consideration should be given to all of Applicants' previous arguments and amendments, and the outstanding rejection should be withdrawn.

Applicants therefore maintain and incorporate by reference herein those arguments and amendments previously advanced on pages 2 through 6 of Amendment A, filed July 14, 2003. Applicants respectfully request that the Examiner reconsider those arguments and amendments, and withdraw the rejections of record. Additionally, although Applicants do not agree that the Examiner's rejections are proper, or that the claims of the present invention read upon the cited prior art of record, Applicants have amended independent claims 1 and 11 for the purpose of expediting prosecution. The amendments to claims 1 and 11 are essentially the incorporation of subject matter from claims 4 and 13 respectively, which claims have now been cancelled without prejudice. Accordingly, Applicants submit that these amendments raise no new issues, and are therefore appropriate for entry after final rejection as well. In light of these amendments, Applicants respectfully request that the Examiner consider the following new arguments and expansion on the previous arguments.

Claim 1 again stands rejected under 35 U.S.C. 102(e) as being anticipated by Singleton et al. (US 2002/0012207A1). Applicants respectfully traverse this rejection for the reasons of record and as follows. The cited reference does not disclose (or suggest) the interfacial roughness features of claim 1 of the present invention, as both previously and currently amended.

Applicants are at a loss to comprehend the Examiner's continued rejection of claim 1 based on only the Singleton reference. The Examiner specifically acknowledges on page 5 of Paper No. 7 that, with respect to the interfacial roughness features of claim 1, "Singleton does not teach or address these limitations." A reference

cannot anticipate a presently claimed invention when that reference does not teach or address all of the limitations of the claims. For this reason alone, the Examiner should have withdrawn his Section 102 rejection of claim 1.

The Examiner, however, later asserts that the claimed features at issue – those he acknowledges are not taught or suggested in the prior art – must still “necessarily” be included in the reference because Singleton’s film “exhibits substantially the same structure” as that of claim 1 of the present invention. This assertion is erroneous though, because it directly contradicts the express teachings of the prior art reference, as well as the plain language of claim 1 of the present invention. The recited interfacial roughness features of claim 1 are a part of the claimed structure. It is entirely inappropriate for the Examiner to assert that Singleton exhibits “the same structure,” while also acknowledging that Singleton fails to teach or address claimed structural features. The Examiner’s statements appear to be arguing something akin to a claim of inherency, but entirely fail to provide any evidentiary support for such a claim. Accordingly, for at least these reasons, the rejection should be immediately withdrawn.

Moreover, the Examiner’s assertion that Singleton must somehow “necessarily” include the interfacial roughness limitations of the present invention is without merit. Nowhere (as the Examiner even acknowledges) does Singleton teach, illustrate, or otherwise suggest any layer configuration resembling the structure shown in Fig. 5 of the present Application. Fig. 5 of the present Application illustrates a structure which is found nowhere in Singleton. Applicants specifically directed the Examiners’ attention to Fig. 5 in Amendment A, but the Examiner has not even commented on this

unique structural configuration of the present invention. Accordingly, for these additional reasons as well, the rejection of claim 1 should be immediately withdrawn.

The Examiner's further assertions that the structure of Singleton is the same as that of the present invention are also directly contradicted by the text of Singleton. The Examiner asserts on page 6 of Paper No. 7 that one skilled in the art would know to select NiMn as the material for forming Singleton's AFM layer 306 (Applicants assume that the Examiner meant to say the AFM layer 307). (See Fig. 3B). Singleton, however, specifically teaches otherwise. Singleton does teach that NiMn can be used for some antiferromagnetic layers (see Figs. 1A-2B), but only for "simple spin valve structures." (Paragraph [0030], lines 1-4; paragraph [0031], line 1). Singleton expressly states, on the other hand, that the AFM layer 307 cited by the Examiner is used only in different "synthetic antiferromagnetic ('SAF') spin valve structures that use specular scattering layers." (Paragraph [0031], lines 1-3). Applicants here wish to remind the Examiner that he has determined Singleton's specular scattering layer 305 to be equivalent to the recited "compound" in claim 1 of the present invention.

Singleton does not though, teach or suggest that NiMn is a suitable material for the AFM layer in an SAF spin valve structure, as cited by the Examiner. In fact, Singleton teaches away from such a conclusion. Singleton specifically teaches that only Ru, Rh, Cr, or a mixture thereof, can be included in the antiferromagnetic coupling layer. (See paragraph [0032]). Singleton here clearly distinguishes between the different materials used in simple spin valve structures versus those in SAF spin valve structures.

Applicants respectfully request that the Examiner review Singleton's teachings on this matter, and withdraw the rejection for these reasons as well.

As now amended, claim 1 features (in addition to the unique interfacial roughness features) that the recited compound is formed by combining one of oxygen, nitrogen, sulfur, and carbon *with an element included in the antiferromagnetic bonding layer*. As discussed above, Singleton teaches no such structure. Singleton teaches no common elements used in both of its specular scattering and antiferromagnetic coupling layers. Accordingly, Singleton cannot meet this recited feature of the presently claimed invention, and the rejection should be withdrawn for these additional reasons as well.

Claims 2 and 3 again stand rejected under 35 U.S.C. 103(a) as being unpatentable over Singleton, and further in view of Miyauchi et al. (EP 0 749 112 A2). It also appears from the Examiner's remarks from paragraph 8, on page 22, that he meant to include claim 4 in this rejection. Applicants will assume such is the case. Applicants therefore respectfully traverse this rejection for the reasons of record, those discussed above, and as follows. Claims 2 and 3 both depend directly or indirectly from independent claim 1, and therefore include all of the features of the base claim, plus additional features. Neither reference teaches or suggests anything of the interfacial roughness features of the present invention. Accordingly, for at least these reasons, this Section 103 rejection of claims 2 and 3 should be withdrawn as well.

Furthermore, the rejection of claims 2 and 3 should also be withdrawn because neither of the cited references, whether taken alone or in combination, can achieve the advantages realized by the present invention. One skilled in the art will know

that, in an apparatus utilizing the specular scattering layer of Singleton, material deposited on the antiferromagnetic coupling layer 307 to form the specular scattering layer 305 will tend to form into islands. This formation effect leads to a spaced aggregation of the material over the layer 307, which thereby negates the possibility of establishing an ultrathin film of substantially uniform thickness over the surface of the layer 307, which would be desirable. Because of the unique claimed features of the present invention, on the other hand, advantageously thin and substantially uniform compound layers may be established over the antiferromagnetic bonding layer, advantages which the prior art cannot achieve. Accordingly, for these reasons as well, the rejection should be withdrawn.

Claims 11 and 12 again stand rejected under 35 U.S.C. 103(a) as being unpatentable over Singleton and Miyauchi, and further in view of Maeda et al. (US 5, 955,211). Applicants respectfully traverse this rejection for the reasons of record, those discussed above, and as follows. Independent claim 11 of the present invention recites similar interfacial roughness features to those recited in independent claim 1, and has also been amended similarly. Furthermore, just as with Singleton and Miyauchi, Maeda also fails to teach or suggest any of the interfacial roughness features, or common elements between the two layers, as in amended claim 11 of the present invention. Applicants further note that, in maintaining this previous rejection of claims 11 and 12, the Examiner does not even acknowledge or attempt to rebut the interfacial roughness features of claim 11 added in Amendment A. Accordingly, this Section 103 rejection should also be withdrawn.

Claim 13 again stands rejected under 35 U.S.C. 103(a) as being unpatentable over Singleton, Miyauchi, and Maeda, and further in view of Lai et al. (US 2001/0012187A1). Claim 13 has been cancelled without prejudice, rendering this rejection now moot.

Claim 1 again stands rejected under 35 U.S.C. 103(a) as being unpatentable over Gill et al. (US 6,181,534) in view of Singleton. Applicants respectfully traverse this rejection for the reasons of record, those discussed above, and as follows. The Examiner specifically acknowledges on page 12 of Paper No. 7 that, like Singleton, “Gill does not teach the roughness requirements of claim 1.” The Examiner’s continued rejection of this claim is therefore without support, and entirely inappropriate.

Section 2143.03 of the MPEP requires that, to establish a *prima facie* case of obviousness against a claimed invention, all features and limitations of that invention must be taught or suggested in the prior art. In the present case, however, the Examiner has not satisfied this requirement, and therefore has not established a *prima facie* case of obviousness against the present invention. Furthermore, the Examiner even further acknowledges on page 13 of Paper No. 7 that neither of these two cites references teaches the interfacial roughness features of the present invention. The Examiner’s continued maintenance of this rejection is thus indefensible, when the Examiner repeatedly acknowledges that the prior art does not teach or even address the specific recited structure of the present invention. Accordingly, this Section 103 rejection of claim 1 based on Gill and Singleton should be immediately withdrawn.



Claims 2 and 3 again stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gill, Singleton, and Miyauchi. Applicants respectfully traverse this rejection for the reasons of record, and those discussed above. The Examiner should withdraw all repeated rejections where he continues to acknowledge that none of the references teach the recited structure of the present invention.

Claims 4-6 again stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gill, Singleton, Miyauchi, and Lai. Claim 4 has been cancelled without prejudice, rendering this rejection thereto now moot. With respect to claims 5 and 6, however, Applicants respectfully traverse this rejection for at least the reasons discussed above, and submit that this rejection as well should be withdrawn.

Claims 11-13 again stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gill, Singleton, Miyauchi, Lai, and Kamiguchi (US 6,088,195). As discussed above, the rejection of claim 13 is now moot. With respect to claims 11 and 12, however, Applicants respectfully traverse this rejection as well for the reasons of record, those discussed above, and as follows. Kamiguchi (like the other previously discussed prior art references) neither teaches nor suggests any of the interfacial roughness features of the present invention. The Examiner has not even asserted that Kamiguchi teaches such features. Accordingly, this rejection should also be withdrawn.

Lastly Applicants again point out to the Examiner that none of the many cited references teach or address interfacial roughness features, as in the present invention – a fact which has been repeatedly recognized by the Examiner as well. Additionally, none of the prior art teach or suggest the formation of a compound effected

by oxidation, nitriding, sulfurization, or carbonization on the surface of antiferromagnetic bonding layer, while also sharing at least one element in common with the layer. The only justification for finding such elements in the prior art is the Examiner's own, unsupported assertion that the limitations must exist in the prior art. Without actual, objective support, however, such unsupported assertions may not form an appropriate basis for rejection under either Section 102 or 103.

New claims 14 and 15 have been added to depend from independent claims 1 and 11 respectively, and to recite other combinations of features of the present invention. Applicants submit that no new issues requiring additional search by the Examiner have been raised by the addition of these two dependent claims. Accordingly, entry, consideration, and allowance of claims 14 and 15 should be allowable after final rejection.

For all of the foregoing reasons, Applicants submit that this Application, including claims 1-3, 5-6, 11-12, and 14-15, is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

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Respectfully submitted,

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